

**SYSTEMS AND METHODS FOR SCULPTING VIRTUAL OBJECTS  
IN A HAPTIC VIRTUAL REALITY ENVIRONMENT**

Abstract of the Disclosure

A user of a virtual object or computer model uses a haptic interface device in the real world to manipulate a virtual tool in a virtual environment to interact and modify the virtual object. The user uses the virtual tool in a sculpting mode to modify the shape of the virtual object by adding, removing, or modifying the material of the object. The user feels an interaction force from the virtual tool as it interacts with and modifies the virtual object. The designer can set geometric constraints, such as a constraint point, constraint line, or constraint surface, to limit or guide the movement of the virtual tool.

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